

May-June 2026		
B. Tech Program Scheme IIB		
Regular Examination: LY Semester: VIII		
Course Code: ITDLC8021	Course Name: Natural Language Processing	
Date of Exam: 21/5/2026	Duration: 02.5 Hours	Max. Marks: 60

Instructions: (1) All questions are compulsory. (2) Draw neat diagrams wherever applicable. (3) Assume suitable data, if necessary.				
Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	Explain FST with an example.		CO2	U
b)	How a Bottom-up parser can be used for processing natural language and State its limitations.		CO3	U
c)	Examine how phrase structure influences meaning in sentence processing.		CO4	An
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Describe how Regular Expressions and Automata are used in computer science with suitable examples.		CO2	U
b)	Assign POS tags (using Penn Treebank tags) to the sentence "A girl was reading a novel" and briefly justify your tagging.		CO3	A
c)	Discuss the challenges faced in Natural Language Processing.		CO1	U
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Given the corpus: <S> The cat chased the mouse </S> <S> The dog chased the cat </S> <S> The cat ate the fish </S> <S> The dog ate the bone </S> - Construct a bigram language model from the given corpus. - Determine the most probable next word following the sequence "The cat". - Compare the probabilities of the sentences: "<S> The dog chased the cat </S>" "<S> The dog ate the fish </S>" and identify which sentence is more likely according to the bigram model.		CO2	A

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b)	Consider the corpus: • The match was delayed due to rain. • Players waited inside the pavilion. • Fans cheered loudly after the game resumed. Using Laplace smoothing , calculate the probability of: "players cheered"		CO3	An
c)	Explain the process of semantic attachment in Noun Phrases, Verb Phrases, and Prepositional Phrases with suitable examples.		CO4	U
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	A chatbot incorrectly interprets the sentence: " <i>The bank near the river was crowded.</i> " Analyze how lexical semantics and lexical relations such as synonymy and polysemy affect meaning interpretation in NLP systems. Suggest suitable techniques to reduce ambiguity.		CO4	An
b)	Demonstrate how reference phenomena (anaphora, cataphora) can be handled in an nlp system with examples.		CO5	A
c)	Apply NLP techniques to design a Machine Translation system and retrieval system.		CO6	A
